To: Senator George Runner (Ret.)   Date: February 16, 2012

From: Joe Fitz *Rf for*
Chief Economist

Subject: Dynamic Sales and Use Tax Revenue Impacts

This memo responds to your request that we estimate the dynamic revenue impacts of the Governor's proposal to increase the sales and use tax (SUT) rate for the period 2013 through 2016. As this memo will explain, California's current dynamic revenue modeling capabilities are limited at best; consequently, the results should be viewed with caution.

Summary of Modeling Limitations. In our judgment, there is only one dynamic revenue estimation model capable of providing credible results for a request such as yours, a model created by the Department of Finance (DOF) called the dynamic revenue analysis model (DRAM).[1] Specifically, California had a dynamic revenue estimating requirement in place for DOF from 1994 through 2000 under Chapter 393, Statutes of 1994 (SB 1893 Campbell). The state worked with University of California economists to construct a large economic model capable of looking at dynamic effects, and DOF was given resources to provide information on dynamic effects in its analyses of tax bills and proposals.

As noted above, the requirement that DOF use its DRAM model to score tax proposals sunset in 2000. Because of budgetary and staffing considerations, DOF staff has not updated the model since at least 2002.   Since the model's coefficients have not been updated in approximately ten years, one should view its current results with caution. There have been innumerable changes in laws, the economy, and technology over the past ten years, casting doubt on the validity of the mathematical relationships in the model as being representative of the 2013 to 2016 period for which the Governor's proposal would be in effect. However, we are using this particular model because, to our knowledge, there are no other credible California economic models that capture the range of the dynamic impacts at the level of detail of the DRAM model. Additionally, we have had experience analyzing DRAM model results in previous years, and at the time the results seemed fairly reasonable.

In addition to the model being dated, it is a less than ideal tool to analyze the Governor's proposal for two other reasons:

- The DRAM model assumes a balanced budget. In this instance, the tax-increasing provision is accompanied by augmentation in spending. A complete analysis would include a dynamic modeling of increased public spending, and to our knowledge no model exists with this capability.

- The Governor's Budget is proposing that the SUT increase be temporary. Economic research has shown that consumers and businesses tend to react differently to temporary tax changes compared to permanent tax changes. The DRAM model was created to analyze permanent tax changes. We do not know the extent to which consumers and businesses may react differently to such a temporary tax compared to how they would react to the same proposal if it were a permanent tax increase. Additionally, the model results occur over a period of five years (longer than the four years for which the Governor's proposal would be in place). The model does not break out impacts for individual years.

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[1] The model documentation, *Dynamic Revenue Analysis for California,* 1996, is available at the Department of Finance web site, www.dof.ca.gov.

The DRAM Model's Results. With the above caveats in mind, we began by obtaining from DOF staff static revenue estimates of the Governor's proposal. Static revenue estimates for the three full fiscal years the higher rates would be in effect are shown in Table 1 (attached). For purposes of making this dynamic revenue estimate, we assumed an annual average of these three years of static revenue estimates as a starting point for making our dynamic estimates.

The investment and employment impacts of a billion dollar SUT impact were most recently estimated by Finance for 2002. We updated the statistical relationships of these data to represent the 2013 to 2016 time period using the change in the California Consumer Price Index (CCPI) from fiscal year 2002-03 to fiscal year 2013-14, as forecast in the *Governor's Budget.*[2]

As shown in Table 1, the average static revenue estimate is $2,773 million for the three fiscal years of interest. Table 2 shows the estimated dynamic revenue impacts of a billion dollar increase in the sales and use tax. The DRAM model results show that SUT revenues would be about 8 percent less than the static estimates. Alternatively stated, a static sales and use tax revenue estimate for a billion dollar ($1,000 million) increase yields a dynamic revenue estimate of $920 million. Associated with the tax increase under a dynamic revenue estimate are employment losses of 8,474 jobs and $96 million less in business investment spending.

Table 3 shows the impacts of the dynamic revenue estimates of Table 2 applied to the static revenue estimate of Table 1. The impacts are 2.773 times greater than the Table 2 figures. A static revenue estimate of $2.773 billion, implies a dynamic revenue estimate of $2.551 billion, $222 million lower. The dynamic model results also indicate that the tax increase would reduce California employment by about 23,000 jobs and reduce business investment by $267 million. The decline in jobs represents about 0.2 percent of California nonagricultural employment in 2011.

One more impact of the sales and use tax proposals that should be discussed is the effect on inflation as measured by the consumer price index (CPI). The U.S. Bureau of Labor Statistics, the federal agency responsible for calculating the CPI, includes sales and use taxes in calculating it. While inflationary impacts of tax change proposals are dynamic impacts, we could not find a discussion of the inflationary impacts in the documentation of the DRAM model. Nor could the DOF staff provide us with any model output that measured the inflation impacts of sales and use tax change proposals run with its dynamic model.

However, we were able to calculate an estimate of the direct inflationary impact of a $2,773 million sales and use tax increase on the CPI without the benefit of the DRAM model. While direct effects are only part of a more complete dynamic analysis, at least they provide a starting point.[3] A sales and use tax increase raises the costs of taxable goods to the degree that the costs of the tax increase are passed on to consumers. While studies show varying results, it seems likely that nearly all of the proposed sales and use tax increase would be passed on to consumers. The *Governor's Budget* forecasts taxable sales to be $572.9 billion in 2013. A $2.773 billion tax increase would raise taxable consumer spending by about 0.5 percent if the entire amount of the tax is passed on to consumers. The likely taxable categories of the BLS consumer expenditure items account for about 27 percent of the entire

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[2] This is the final year for which the *2012-13 Governor's Budget* makes available a forecast of the CCPI.

[3] The dynamic inflationary impacts of a sales and use tax increase are complicated. While the direct costs of taxable goods increases, there are employment and investment declines as discussed earlier. (See Tables 2 and 3.) These declines could reduce overall demand, which could reduce the overall inflation rate. Without a dynamic impacts model it is difficult to say if the direct and indirect inflationary impacts combined increase or decrease the CPI.

CPI.[4] These figures imply that the overall California CPI would increase by about 0.1 percent as a direct effect of the tax increase.

JF:jf

Attachment

cc: Ms. Kristine Cazadd
    Ms. Margaret S. Shedd
    Mr. Robert Ingenito
    Mr. Bill Benson

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[4] The BLS expenditure categories judged to include products that are mostly, if not entirely, subject to sales and use taxes include: nonalcoholic beverages, food consumed away from home, alcoholic beverages, apparel, new and used motor vehicles, motor fuel, motor vehicle parts and equipment, video and audio, educational books and supplies, personal computers and peripheral equipment, tobacco and smoking products, and personal care products. For purposes of determining an estimate of the taxable share of the CPI all spending in these categories is assumed to be subject to sales and use taxes.

Table 1

Proposal: Increase the sales tax rate by one half percent	Static Revenue Estimates (Millions of Dollars)
Fiscal Year 2013-14	$2,557
Fiscal Year 2014-15	$2,771
Fiscal Year 2015-16	$2,991
Average (Three fiscal years, full-years revenues)	**$2,773**

Table 2

Estimated Dynamic Revenue Impacts of a One Billion Dollar Increase in the Sales and Use Tax, Holding All Other Taxes Constant And Assuming a Balanced Budget[a]

Dynamic Revenue Impact (Percent)	-8%
Dynamic Revenue Impact (Millions of Dollars)	-$80
Net Tax Revenues (Millions of Dollars)	$920
Jobs Impacts (Number of Jobs)	-8,474
Business Investment Impacts (Millions of Dollars)	-$96

a/ As discussed in the text, these results must be viewed with caution for at least the following three reasons: (1) The DRAM model assumes a balanced budget. In this instance, the tax-increasing provision is accompanied by augmentation in spending. A complete analysis would include a dynamic modeling of increased public spending, and to our knowledge no model exists with this capability; (2) The Governor's Budget is proposing that the SUT increase be temporary. Economic research has shown that consumers and businesses tend to react differently to temporary tax changes compared to permanent tax changes. The DRAM model was created to analyze permanent tax changes. We do not know the extent to which consumers and businesses may react differently to such a temporary tax compared to how they would react to the same proposal if it were a permanent tax increase. Additionally, the model results occur over a period of about five years (a slightly longer time than the four years for which the Governor's proposal would be in place). The model does not break out impacts for individual years; (3) The model's coefficients have not been updated in about ten years.

Source: Communication with the Department of Finance staff, January 2003. Documented in memo from Joe Fitz to Honorable Bill Leonard, January 30, 2003, "Sales and Use Tax Increase Revenue Impacts." Employment and investment relationships updated from 2002 to fiscal year 2013-14 using the California consumer price index forecasts from the *2012-13 Governor's Budget*.

Table 3

Estimated Dynamic Revenue Impacts of Specified Sales and Use Tax Increases, Holding All Other Taxes Constant And Assuming a Balanced Budget[a]

Static Sales and Use Revenue Estimate (Millions of Dollars)	$2,773
Dynamic Revenue Impact (Percent)	-8%
Dynamic Revenue Impact (Millions of Dollars)	-$222
Net Tax Revenues (Millions of Dollars)	$2,551
Jobs Impacts (Number of Jobs)	-23,499
Business Investment Impacts (Millions of Dollars)	-$267

a/ As discussed in the text, these results must be viewed with caution for at least the following three reasons: (1) The DRAM model assumes a balanced budget. In this instance, the tax-increasing provision is accompanied by augmentation in spending. A complete analysis would include a dynamic modeling of increased public spending, and to our knowledge no model exists with this capability; (2) The Governor's Budget is proposing that the SUT increase be temporary. Economic research has shown that consumers and businesses tend to react differently to temporary tax changes compared to permanent tax changes. The DRAM model was created to analyze permanent tax changes. We do not know the extent to which consumers and businesses may react differently to such a temporary tax compared to how they would react to the same proposal if it were a permanent tax increase. Additionally, the model results occur over a period of about five years (a slightly longer time than the four years for which the Governor's proposal would be in place). The model does not break out impacts for individual years; (3) The model's coefficients have not been updated in about ten years.